## What is claimed is:

- 1. A method of inhibiting a degenerative condition of a retinal photoreceptor cell, said method comprising contacting a photoreceptor cell having a degenerative condition with a composition comprising a brimonidine compound in an amount effective to inhibit the degenerative condition.
- 2. The method of claim 1 wherein the brimonidine compound has the following structure:

Where R is  $C_{1-5}$  alkyl, Br, Cl or  $NO_{2}$ , and pharmaceutically acceptable salts thereof.

- 3. The method of claim 1, wherein the brimonidine compound is brimonidine tartrate.
- 4. The method of claim 1, wherein the amount of brimonidine is between about 0.01% and about 0.05% in a pharmaceutically acceptable vehicle.
- 5. A method of treating a degenerative condition of retinal photoreceptors, said method comprising administering to a subject in need thereof, a composition comprising a brimonidine compound in an amount effective to delay or reverse said condition.
- 6. The method of claim 5, wherein the brimonidine compound is administered topically to the eye.
- 7. The method of claim 5, wherein the amount of brimonidine provides between about 10 and about 1000 nanomolar intraocular concentration.
- 8. The method of claim 5, wherein said subject is a vertebrate.
- 9. The method of claim 8, wherein said vertebrate is a mammal.
- 10. The method of claim 9, wherein said vertebrate is a human being.
- 11. The method of claim 5, wherein said condition is retinal detachment.
- 12. The method of claim 5, wherein said condition is age-related macular degeneration.
- 13. The method of claim 5, wherein said condition is retinitis pigmentosa.

- 14. A method of reversing or delaying degeneration of a photoreceptor cell in a retina, comprising contacting said retina with a composition that includes an amount of a brimonidine compound effective to inhibit GFAP expression in Müller cells.
- 15. A method of reversing or delaying degeneration of a photoreceptor cell in a retina, comprising contacting said retina with a composition that includes an amount of a brimonidine compound effective to stimulate upregulation of glutamine synthetase in Müller cells.
- 16. The method in claim 14 or 15, wherein the brimonidine compound is brimonidine tartrate.
- 17. The method in claim 14 or 15, wherein the contacting is by topical administration.
- 18. A kit comprising in suitable container means, a brimonidine composition pharmaceutically suitable for topical administration to the eye, and instructions for administration to a subject in need of treatment for retinal degeneration.
- 19. A composition comprising a brimonidine compound and at least one human growth factor selected from the group consisting of basic fibroblast growth factor (bFGF), glian-derived neurotrophic factor (CNTF), pigment epithelium-derived factor (PEDF), glial-derived neurotrophic factor (GDNF), and brain-derived neurotrophic factor (BDNF).
- 20. The composition of claim 19 comprised within a pharmaceutical vehicle suitable for topical administration.
- 21. A composition comprising a brimonidine compound and a wetting agent.
- 22. The composition of claim 21 wherein the wetting agent is selected from the group consisting of tyloxapol, polyvinyl alcohol, hydroxyalkyl cellulose, methylcellulose, polyvinyl pyrrolidone, or polyquarternium-10.
- 23. The composition of claim 19 or 21 further comprising an anti-allergenic/anti-inflammatory drug selected from the group consisting of H1 histamine receptor antagonists, non-steroidal anti-inflammatory compounds (NSAID) and mast cell stabilizers.
- 24. The composition of claim 23 wherein the brimonidine is brimonidine tartrate, and the anti-allergenic/anti-inflammatory agent is selected from the group consisting of H1 histamine receptor

antagonists, Ketotifen hydrochloride, Levocabastine hydrochloride, Olopatadine hydrochloride, emedastine difumarate, Ketorolac tromethamine, Diclofenac sodium, Cromolyn sodium and Lodoxamide tromethamine.